REGIONAL OFFICE FOR THE WESTERN PACIFIC
of the
World Health Organization
Manila

REPORT ON THE SEMINAR ON FOOD SANITATION

Manila, Philippines, 16-27 October 1962

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SEMINAR ON FOOD SANITATION

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MANILA, PHILIPPINES

16-27 October 1962

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NOTE

The views expressed in this report are those of the advisers and participants at the seminar and do not necessarily reflect the policy of the World Health Organization.

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This report has been prepared by the Regional Office for the Western Pacific of the World Health Organization for governments of Member countries in the Region and for those who participated in the Seminar on Food Sanitation, Manila, October 1962. A limited number of copies are available on request to persons officially or professionally concerned in this field of study.

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"It has been estimated," he said, "that safe water and food supplies may reduce by one-half the rate of illness in the world". Dr. Fang emphasized that the introduction of a public food hygiene programme in a developing country was a huge undertaking but added that "it is important to get started and to expand, and we should realize that it is possible to do something useful in food hygiene under any condition and under any budget".

2.2 Organization

Mr. James Arbuthnot, Regional Adviser in Environmental Sanitation and Seminar Secretary, then outlined the arrangements which had been made for the seminar. He also introduced the two consultants, Professor N. A. Milone and Mr. R. Johnson, and invited them to address the seminar. (See Annexes 2 and 3).

Mr. Patrick Eric Taye, Chief Food and Drug Inspector, Ministry of Health, Singapore, was unanimously elected Chairman.

2.3 Seminar schedule

The seminar schedule, reproduced in Annex 4, was adopted.

2.4 Election of committees

The following participants were elected to serve on the Co-ordinating Committee: Mr. Vicente F. Buencamino, Dr. Masaharu Tonomura, and Mr. Patrick Wong Peng Ho.

The following participants were elected to serve on the Editorial Committee: Dr. Jose Y. de Guia, Dr. L. S. Sodhy, Mr. Suh Jung Hyun and Mr. Nguyen Sy Tin, each of whom acted in turn as rapporteurs for the plenary sessions.

2.5 Discussion groups

It was agreed that for discussion of the introductory topic the participants and observers from Japan, Philippines, and China should form discussion group A; those from Malaya, Singapore and Korea should form group B; and those from Hong Kong, Viet Nam, North Borneo and Sarawak group C. The membership of discussion groups D to L appears in Annex 5.

2.6 Lectures

On the afternoon of Wednesday, 17 October, Dr. Angel D. Paguio, University of Santo Tomas, delivered a lecture entitled, "Cysts and Ova of Intestinal Parasites Found in Vegetables Usually Eaten Raw". Mr. John Blaeske, WHO Sanitarian, delivered a lecture entitled "The Problem of Food Sanitation in the Home",

3. PRINCIPAL FACTORS AFFECTING FOOD PRACTICES AND FOOD SANITATION PROGRAMMES

On the afternoon of the opening day of the seminar, groups A, B, and C discussed the introductory topic--factors affecting the food practices of people in the Region. The object of these discussions was to establish in broad outline which of these factors were significant in the promotion of food sanitation, since any food sanitation programme must, if it is to be successful, be related to the food practices of the people concerned.

3.1 Climatic characteristics

The total population of Member countries of the Region is approximately 200 million and most of the Region is contained between latitude 45°N and latitude 45°S. Most of the countries of participants have a tropical climate with a constantly high temperature which varies within relatively small limits and wet and dry rather than hot and cold seasons. On the other hand, Korea and Japan in the northern part of the Region have climatic extremes, with a high temperature in summer and a low one in winter.

The high temperatures experienced in the countries of the Region are important from the point of view of food spoilage and waste. Because only a very small minority of the people have refrigerators, perishable food cannot be kept for long. As a result it is the common practice to eat this type of food on the day it is bought.

In warm countries flies and other insects may breed more rapidly and continuously. Unless vigorous control measures are applied this increases the possibility of the contamination of food.

3.2 Religious and racial practices

It was not felt that religious practices were very important in relation to food sanitation. Racial customs were considered to be of greater significance since they affected, at least to some extent, the types of food eaten and the ways in which it was prepared and cooked. In Malaya, for instance, the Chinese cook and eat their food fresh, but Malays cook their food in advance and warm it when required. The Chinese do not usually drink cold water and they boil liquid milk before use.

There are also different racial habits in the eating of food. For instance, some groups use their hands for eating in their homes and eat from common dishes from which all help themselves with their hands. It is usual, however, for hands to be washed before taking meals. This practice was discussed at some length and participants finally concluded that it did not constitute a serious hazard to health, where food was prepared fresh for every meal.

3.3 Environmental sanitation

The two factors under this heading to which the greatest importance was attached were water supply and excreta disposal. The use of polluted water and unsatisfactory methods of excreta disposal which might lead to the contamination of food by pathogenic bacteria or intestinal parasites are common in all the participating countries and are important factors in the high incidence of food-borne illnesses.

3.4 Social and economic factors

In all the countries considered by the seminar there are wide variations in the incomes of the people and all have their poor, middle class and wealthy groups. The economic status of the people has an effect on their diet; people in the higher income groups tend to eat more meat than the poorer people who usually regard meat as a luxury.

In most of the countries a high proportion of the people live in rural areas and get their living from the land. In Korea, for example, it is estimated that about 65% of the population is employed on the land, in Malaya about 60% and in the Philippines 75%. It is usual for people living in rural areas to produce much of their own food and they customarily prepare and eat their food in their own homes.

In urban areas, however, people have to buy almost all their food and there is a good deal of communal feeding away from the home.

4. FOOD-BORNE DISEASES

The seminar considered the subject of food-borne diseases (see Annex 6) under the following headings:

(a) data on the extent to which food-borne illnesses were known to occur in the Region, classified as bacterial, parasitic, and chemical and natural poisons;

(b) whether these data were complete or adequate; and

(c) the importance which should be attached to these illnesses.

From the data which the seminar was able to procure from the participants itwas obvious that in the Region there is a high incidence of most kinds of food-borne diseases. Furthermore, it was felt that the actual incidence was much higher than that shown by the records of health authorities, because of the poor compilation of statistics and the fact that many of these diseases were not notifiable.

4.1 Bacterial diseases

Based on available information, it was estimated that the resultant loss in man-days due to incapacity from the various diseases of bacterial origin (i.e., diseases other than parastitic diseases) amounted to a minimum

of US$71 million per annum. Factors used in arriving at this estimate included cost of hospital treatment, loss in wages as a result of hospitalization and the estimated average minimum wage scale in the participants' countries. The information used was obtained from annual reports and participants' estimates based on their own experience.

4.2 Parasitic diseases

It was agreed that at least half of the 180 million people living in the participants' countries suffered from parasitic disease.

Assuming that 30% of the population is the working population and making a very modest estimate of loss of efficiency of people suffering from these diseases, the annual loss must amount to at least 390 million man-days of productive labour, which at the average minimum daily wage estimated at $1.14 for the countries represented, means an annual loss of US$470 million to these countries. This was a very conservative estimate because the amount was based on minimal figures and did not include the non-working population where the socio-economic loss might be as great.

4.3 The investigation of outbreaks of food-borne diseases

The methods used in the investigation of food-borne diseases did not vary to any great extent throughout the participants' countries, but there appeared to be some variation in the extent to which such outbreaks were notified and the promptness with which this was done. In some countries information about an outbreak of food-borne illness became available some time after the incident had occurred; in these cases, investigation was limited to field inquiries without laboratory examinations. Because of insufficient personnel and laboratory facilities a number of outbreaks passed without detailed investigation.

5. FOOD SUPPLIES

People living in the countries represented at the seminar are largely dependent on rice as their basic foodstuff, with varying proportions of meat, fish and vegetables.

5.1 Sources of food

Families living in rural areas produce a substantial proportion of their own food requirements, but in urban areas domestic production is insignificant. However, even in the countryside people usually have to buy a certain amount of their food; in these areas it is common to find that a large number of small producers bring their food surpluses to markets for sale.

Some countries have to depend almost entirely on imported foods but others import varying proportions of their food requirements.

5.2 Methods of food production

5.2.1 Rice and cereals

Rice and other cereals are grown widely in the Region but there are no known hazards to health through foods attributable to methods used in the production of these commodities.

5.2.2 Vegetables

The most important hazard created in the production of vegetables is due to the use of night soil and sewage as a fertilizer. Where this is done there is a risk that vegetables may become contaminated with intestinal parasites and pathogenic organisms.

In Korea few vegetables can be grown in the winter months. Because of the difficulty of obtaining fresh vegetables during the winter a favourite dish is "kimchi". This is made of vegetables seasoned with salt, pepper, garlic, etc., stored in a clay pot and fermented before being eaten. Providing these vegetables are stored for a sufficient length of time before they are eaten, the danger from intestinal parasites should be minimized and these vegetables are believed to be safer in this respect than fresh vegetables eaten during the warmer months.

A further possible hazard is the spraying of vegetables with insecticides and it was thought that Member countries should give early consideration to this subject.

5.2.3 Fruits

The spraying of growing fruit with insecticides is also a subject to which attention should be given to ensure that adequate precautions are taken against any possible risks, although spraying is apparently carried out only on a limited scale in the Region.

5.2.4 Fish

It is a common practice in some rural areas to construct latrines or to defecate on the banks of ponds and rivers in which fish are caught and in some areas fishponds are fertilized with night soil. Fresh water shellfish are also often gathered from polluted water.

Sea-fish and shellfish are caught or collected from sewage polluted estuarial and coastal waters, and the only country exercising control over the raising of shellfish is Japan. With the exception of Japan, fishing is mostly coastal and by fishermen operating individually on a small scale.

5.2.5 Poultry

Chicken and ducks, including their eggs, are in the main produced in small flocks over which little or no control is exercised. However, there is some large-scale production. Only relatively few dressed birds are sold, most persons preferring to buy live birds which they kill and dress in their own homes.

5.2.6 Pork, beef and goat meat

Little or no control is exercised over the feeding of pigs which are often allowed to eat raw garbage and human excreta. They are often regarded as scavengers, although in some areas it is the practice to boil their food.

Cattle often feed on pasture land which is contaminated with human excreta and parasites and they may also drink contaminated water.

Goats are kept domestically to produce meat and milk for the family. The milk is usually boiled before consumption.

There are various diseases, apart from parasitic infestations, from which food animals may suffer while they are alive and which may result in the infection of meat produced from them. Tuberculosis and septicaemia were cited as examples.

5.2.7 Milk

Very little fresh milk is produced in the participants' countries, except in Japan. Most of the milk consumed is imported in the form of condensed and evaporated milk and milk powder. Much of the milk powder is reconstituted for sale and it is the practice in some countries to manufacture "filled milk" by reconstituting skimmed milk powder and adding coconut oil. This product is usually canned. In Malaya condensed milk is being manufactured from skim milk powder, butter and sugar.

Ice-cream is produced in large quantities by both large and small manufacturers.

5.2.8 Soft and fruit drinks

Large quantities of these drinks are manufactured and should be subjected to close public health control, particularly those with high acidity in view of the possibility of toxic metallic contamination. In many areas hawkers produce drinks by squeezing fruits of various kinds and sugar cane. This practice also poses possible health dangers.

6. FOOD PROCESSING, STORAGE, DISTRIBUTION AND SALE

6.1 Processing

The methods generally used in the Region in the processing of food may be divided into the three following categories:

(a) traditional, in which machinery is not used and in which weather is the main agent, e.g., natural drying with or without salting;

(b) a combination of traditional and modern, in which some machinery may be used;

(c) modern, e.g., canning and freezing.

Various examples were given of traditional methods of manufacture, which despite advances in food technology and sanitation are still largely adhered to because of economic factors and lack of knowledge of modern manufacturing techniques. For instance, a popular shrimp paste is produced by boiling the shrimps after the addition of salt, leaving them exposed to the air and then treading on them with the bare feet. Another product which is very popular throughout the Region is soya sauce. Its manufacture is a lengthy process involving the cooking of the soya beans, adding yeast and leaving them in the sun to allow fermentation to take place. The beans are then soaked in a brine solution exposed to the sun for three to four months. The fluid is finally poured off and allowed to thicken before being bottled.

Another sauce is made from vegetable material, such as degreased peanuts, rice powder or soya beans. The raw materials are cooked in a solution of hydrochloric acid and then neutralized by the addition of sodium carbonate. After cooling, the liquid is filtered into earthenware jars but is later boiled again for at least five hours. The sauce is finally kept in sedimentation tanks for at least twenty-four hours before bottling.

In the case of the traditional processes and the combination of traditional and modern, an outstanding feature is the almost total failure to observe the principles of sanitation. At a few large plants in large cities some attempt is made to apply sanitary practices.

6.2 Storage, distribution and sale

Because of the hot climate in the greater part of the Region, the storage of perishable foodstuffs poses considerable problems. There is a general shortage of refrigeration due to economic factors, lack of power, and personal preferences for fresh unrefrigerated food.

Since fish is an important part of the total diet and since it is highly perishable, it was felt that greater use should be made of ice or mechanical refrigeration as soon as possible after the fish is caught. One country, subject to certain conditions, permitted the use of an antibiotic in the ice in which fish was stored.

The sale of food, particularly by hawkers, and the public health control over distribution and sale are discussed later in the report (see section 8.3).

7. THE INFLUENCE OF ENVIRONMENTAL FACTORS ON FOOD SANITATION

The environmental factors which were considered to be the most significant in food sanitation were:

(a) water supplies;

(b) waste collection and disposal;

(c) control of insects and rodents.

These environmental factors were very important and it was felt that in many parts of the Region they were having a very adverse effect on food sanitation.

7.1 Water supply

Perhaps the most important environmental factor in food sanitation is water. A copious supply of water is absolutely necessary for cleaning and sanitizing utensils and dishes, and for good personal hygiene. Plenty of good quality water is also essential in the processing of foods.

Water supply in the rural areas of the Region is generally not piped into homes or food establishments and may be unsafe. The most common sources of rural water are shallow dug wells and surface waters and both may become polluted by run-off and washings with every rain. Surface waters may also become polluted by using them for bathing or watering animals. The dug wells are usually open and water is taken from them by bucket and rope, with the obvious risks of contamination which this entails. Rural water supplies are generally not adequate for proper food preparation and serving, or for food processing.

The urban water supplies in the Region are generally better than those in rural areas. In most cities, piped water of reasonably good quality and in adequate quantity is conveniently available to the majority of the inhabitants and to food establishments but this was not so in all cases.

7.2 Waste collection and disposal

7.2.1 Garbage and refuse

The collection and disposal of all wastes is an obvious and highly important environmental factor affecting food sanitation. Considerable progress had been achieved in the Region in providing, improving and extending services to deal with wastes of all kinds, but much remained to be done in this field. The absence of waste collection and disposal services created more serious problems in towns than in rural areas.

The general practice in the Region in urban areas is the use of individual garbage and waste cans or boxes which are emptied into a garbage truck and then transported to a dumping, burial or burning area. In rural areas families dispose of their own garbage and waste but some use is made of ox-carts for collection in villages.

In a few cities in the Region large concrete, metal or wooden curbed platforms are located at strategic points, especially markets, where nearby establishments dump their garbage and wastes for periodic collections by trucks.

7.2.2 Sewage and night soil

In several countries in the Region night soil is deliberately used as fertilizer, but in other countries its use is incidental or limited. In those countries where nightsoil is collected and utilized, vault and bucket latrines are common in urban as well as in rural areas. In towns where this is not practiced, cesspools, septic tanks or sewerage systems are widely used. In rural areas the water seal pit privy is recognized as superior to other types and is beginning to replace them. In those countries which have cold winters, however, this type of privy has the disadvantage that the water seal may freeze.

It was considered that the practice of using night soil and sewage as fertilizer presented a definite food sanitation problem because of the danger of transmitting parasitic diseases. If this practice was to continue research should be carried out to determine if there was an effective and practicable means of ensuring its safety.

The practice of discharging raw sewage into surface waters might result in the pollution of fish and shellfish in rivers and estuarial and coastal waters. This was especially significant where fish or shellfish are eaten raw or partially cooked.

7.3 Control of insects and rodents

Insects and rodents may contaminate foodstuffs and damage them by eating or soiling them. Their control often presented serious problems which were aggravated by the improper construction of food establishments and the improper storage and disposal of refuse, including night soil.

8. FIELD WORK

The effectiveness of any food sanitation programme is largely dependent on the nature and extent of the work carried out in the field and the thoroughness with which it is done. This work includes the inspection of food, both locally produced and imported; the inspection of all premises in which food was manufactured, processed, stored or sold; the inspection of markets and stalls used for the sale of food and of vehicles used for the transport or sale of food; the sampling of food to ascertain its fitness for human consumption; and the education of all sections of the community, including food handlers, the general public and schoolchildren, in the principles of food sanitation.

Although it was difficult to judge how much of this work was being done in the Region, it was clear that a good deal of time and effort was being devoted to it. The picture, however, was by no means uniform and it was obvious that much more field work was being done in some areas, and being done more effectively, than in others. This was inevitable at the present because local conditions varied considerably. Some countries were compact and had well established and effective systems of administration while others had large areas and scattered populations over which control was difficult. Some, because of civil unrest, had not been able to devote the same attention to this subject as others who had not suffered in this way. The general level of environmental sanitation was a further factor which profoundly affected the more specialized subject of food sanitation.

Even within a country the pattern of food sanitation work was often not uniform. It was common to find greater attention being paid to it in towns and cities than in rural areas where distances, widely scattered populations and shortage of staff restricted the amount of work which could be done.

8.1 Inspection of food

8.1.1 Imported food

In some countries there was a fairly close check on food imports, particularly perishable goods such as meat, meat products and dairy products, and certificates of fitness were required from the countries of origin. In others, however, it was surprising to find that little or no public health control was exercised over imported food. The importance of the proper inspection of imported foodstuffs was indicated by the fact that during the year 1961, 6 060 000 tons of food were imported into Japan of which approximately 1 700 000 tons were rejected or had to undergo additional processing before being released for human consumption.

It was considered unfortunate that there should be so much variation in the degree of control over imported food. It was felt that all countries should exercise adequate control and that they should take steps to standardize their requirements. Exporting countries should assist by ensuring that foods sent abroad were produced and/or processed, packed and transported under strict hygienic conditions and that where necessary official certificates to this effect should accompany shipments.

The requirements of importing countries should cover the following points:

(a) safety and cleanliness;

(b) compositional standards;

(c) labelling;

(d) additives, including colourings, flavourings, preservatives and antibiotics.

The seminar noted that a joint FAO/WHO inter-governmental conference on food standards had been held in Geneva on 1 to 5 October 1962. The conference had drawn up recommendations for the guidance of a permanent joint FAO/WHO commission whose task would be to promote international food standards and publish a collection of such standards in the form of a Codex Alimentarius. These food standards would aim at protecting consumers' health and ensuring fair practices in the food trade. Their publication was intended to promote the standardization of foodstuffs in different parts of the world, to help harmonize existing standards and in so doing to further the development of the world's trade in food.

The joint FAO/WHO conference had recommended that the Codex should in time include all the principal foods whether processed, semi-processed or raw, for direct sale to the consumer, or, where appropriate, for manufacturing purposes.

Great attention was paid to food additives and contaminants. The Codex should take in the whole range of these substances since they affected practically all processed foods as well as an ever-increasing number of raw foods (through the use of insecticides, hormones, etc.).

The Codex commission should also concern itself with rules of hygiene, especially in tropical countries.

Broadly speaking, the commission's activities would give world-wide scope to food standardization work such as had already been pursued nationally in many countries as well as internationally between groups of countries (Europe, South America, for example).

The joint conference's recommendations were subject to endorsement by the governing bodies of FAO and WHO.

The seminar expressed its agreement in principle with the conference's recommendations.

8.1.2 Locally produced food

An essential feature of any food sanitation programme is provision for the adequate inspection of all foodstuffs from the point of production until delivery to the consumer. The degree of inspection necessary varies according to the nature of the food and the health hazards which may be associated with it. Particular attention must always be paid to meat and milk and the products made from them.

In urban areas in the Region animals intended for human consumption are usually slaughtered in abattoirs where inspection is performed by veterinary officers or public health inspectors. Often the meat has to be stamped to indicate that it has been inspected and passed.

Animals slaughtered in rural areas, however, are often not inspected at all. In these areas smaller animals such as pigs and goats are frequently slaughtered by the people themselves at their own homes to provide meat for themselves. Inspection under these conditions is not practicable.

As already pointed out most of the milk consumed is imported but some milk is processed or produced by Member countries. The conditions under which this is done should be subject to adequate public health supervision.

Health inspectors generally appeared to have power to seize food which they regarded as unfit for human consumption.

It was suggested, however, that all countries should review their arrangements for inspection of food which they produced and should strengthen them wherever this appeared necessary. In particular they should satisfy themselves that adequate provisions were made for:

(a) adequate inspection of all foods both fresh and cooked;

(b) seizure and disposal of unsound, unwholesome or suspected food;

(c) securing adequate precautions against decomposition and deterioration of perishable articles of food;

(d) prevention of contamination by physical, chemical or biological agencies;

(e) safe and hygienic transportation of foods, e.g., fresh milk, fish, meat, etc.;

(f) prevention of contamination of foods by flies, cockroaches, rodents and other pests;

(g) discouraging the use of unhygienic material for wrapping foods.

8.2 Food premises and markets

Most countries had adequate legislation concerning the hygiene of food premises, particularly shops, restaurants and markets, but in some areas it was not being properly implemented. In many cases this was due to an overall shortage of public health inspectors (who are responsible for the bulk of the work in promoting food sanitation) in the Region and in some countries, to unsatisfactory standards of training. Very few countries had sufficient inspectors with adequate training to cope with the enormity of work in connection with food sanitation.

Where markets were owned by central or local government authorities, these authorities should set an example to private owners of food establishments by providing the best possible facilities to enable a high standard of food sanitation to be maintained.

8.3 Hawkers

The sale of food by hawkers in many countries of the Region was quite a common practice and their control entailed a good deal of work.

In Hong Kong, for instance, there were 1000 licensed stalls in the streets for the sale of meals cooked on the spot and a further 300 for the sale of light refreshments; there were also many hawkers who operated illegally without licenses. To deal with hawkers, a special disciplined hawkers control force had been established. While the seminar recognized that under special circumstances such a force might be necessary to exercise purely police functions, it did not feel that it should be under the control of the health department.

In the city of Singapore alone, there were 9200 licensed hawkers and about 32 500 who were unlicensed. Of the licensed hawkers, 3000 sold cooked food and many of those who were unlicensed also did so.

These hawkers constituted a serious public health problem but social and economic conditions in the countries concerned made it impossible at present to eliminate them or even reduce their numbers substantially. In areas where food hawkers operated, therefore, everything possible should be done to ensure that they were able to maintain a satisfactory standard of food sanitation.

8.4 Health education

The importance of education in raising standards of food sanitation appeared to be generally recognized and a good deal of this work was being done, although there was greater activity in this direction in some areas than in others.

A small number of full-time trained health educators were employed but much of this work was being left to public health officers of different kinds who often had had no special training for it. The co-operation of cinemas in screening health education material was obtained in some countries. Posters, leaflets and similar materials were also used. In some areas lectures were given to groups of food handlers in addition to educational work at the place of work. Talks to groups and associations of the public were also a feature of this work.

So far as schoolchildren were concerned, although talks had been and were still being given to them in school by public health officers, the tendency now appeared to be to instruct teachers in health education principles and to leave it to them to impart the necessary instruction to their pupils.

Several countries in the Region were either using or were beginning to use visual aids in educational programmes in food sanitation. In China, Philippines, Malaya, Viet Nam, and to some extent in Sarawak, such means were being employed advantageously. In Malaya the services of the Department of Information were used for publicity work among rural populations. Mobile units, pictures, posters, charts, etc., were being used for this purpose. Visual aids, however, should be further developed as follows:

(a) government film units in co-operation with health authorities should film, in the country, bad and good practices that are to be met with in the preparation and service of foods, and commentaries in such films should be dubbed in the different dialects common to various parts of the countries of the Region;

(b) mobile health education units should be an integral part of health departments in the various countries in the Region; these units should be fully equipped with movie projectors, etc.;

(c) posters, pictures and charts depicting both bad practices and good practices in food sanitation should be placed side by side to show what should and should not be done;

(d) films and film strips should be exchanged between Member countries of the Region for purposes of comparison.

8.5 Food sanitation in the home

The seminar felt that although no country represented had a specific programme aimed directly at food sanitation in the home, there was in some instances a need for such a programme. Certainly food sanitation in the home needed improvement in some rural areas and some other areas where economic conditions and general sanitary conditions were poor. A programme to improve food sanitation in homes in these areas would be difficult to plan and in any case information was not available to indicate what improvements would be practicable before basic economic and sanitary conditions were themselves improved. To effect such improvements would require considerable health education, probably through home visits. However, considering the importance of the problem in some areas, the seminar felt that an effort should be made to solve it. Studies should be made in these areas of food practices; practical methods of improving these practices should be evolved; and methods of inducing the people to adopt these improvements should be experimented with.

8.6 Bacteriological and chemical laboratories

The necessity for well-equipped bacteriological and chemical laboratories adequately staffed by qualified technical and administrative personnel was emphasized. Laboratories at present available in the Region were, however, inadequate to cope with enhanced programmes of food sanitation. In most areas the number of laboratories was either too small or the laboratories were not adequately equipped and staffed to cope with the many problems arising in food sanitation operations.

There was generally a need to improve existing laboraties and to provide additional laboratories at both central and local levels for the proper implementation of food sanitation programmes. There was also the problem of staffing and this was reflected by the general shortage of technical personnel at all levels in the Region.

To staff the additional laboratories required it would be necessary to recruit the following personnel:

(a) chemists, preferably with post-graduate training in food chemistry or technology;

(b) microbiologists, with qualifications as in (a);

(c) assistants, or supporting staff for (a) and (b), with experience in some of the simpler duties of laboratory tests and sampling operations.

While the field staff were the key personnel for the enforcement of the laws of food sanitation and hygiene, the laboratory supplied the necessary scientific and analytical service, and both of these were necessary for the successful implementation of satisfactory food sanitation programmes in the countries of the Region.

8.7 Field testing aids

Public health inspectors should be trained in the performance of such field tests as were available for screening purposes. Equipment to make these tests was relatively inexpensive and each inspector should have it available for use at all times. For example, several commercial firms sell kits for making in the field tests to detect adulteration, or the presence of certain contaminants, to determine the concentration of sanitizers and materials for making swab tests to determine the efficiency of sanitization of restaurant utensils. A battery-operated ultra-violet light was available which in combination with the use of fluorescent dyes will determine the cleanliness of utensils; it might also be used to detect the presence of rodent urine. The field test for residual phosphatase and the methylene blue tests for milk had been used effectively in the field.

The use of these field tests had the advantage of obtaining results quickly so that positive action could be taken immediately. They also had the added advantage that they helped to reduce the load on the laboratory.

9. LEGISLATION

Participating countries had ordinances and regulations in different forms governing various aspects of food sanitation, including the importation of food, food processing and manufacture, and the inspection of food and food premises. None of the countries, however, appeared to have a single food sanitation act which embraced the whole subject. It was recommended that governments of participating countries should compile all basic legislation in a single act and embody the more detailed and technical legislation in regulations which could be changed easily to take account of changing circumstances.

It should be emphasized, however, that the mere existence of legislation would make no contribution to the improvement of food sanitation. Unless it was properly and impartially enforced legislation was of little value. It was known, unfortunately, that legislation in some participating countries was not being enforced adequately at the present time. Food sanitation legislation in any country must be realistic and must be capable of being enforced. It must be related to existing standards in the country and to those reasonably capable of being attained.

10. PUBLIC HEALTH INSPECTORS

Information was supplied by participants about the number of public health inspectors employed in the Region and the number of extra inspectors required. This information is summarized in the following table:

Country	Number of public health inspectors now in service	Government's present target number of public health inspectors
Malaya	400	700
North Borneo	20	60
Hong Kong	240	340
Philippines	2700 (500 trained and 2200 not trained)	4600
South Viet Nam	140	additional
Japan	4500	10 000
Korea	670	2500
Singapore	49	?
China	405	510

The figures given in this table relate to all public health inspectors employed and not merely to those engaged on food sanitation duties.

The term "public health inspector" as used here is meant to include "sanitary inspectors", "health inspectors", "food and drug inspectors", and other personnel with similar training or performing similar duties.

10.1 Recruitment

The seminar concluded that the personnel at present engaged in the promotion of food sanitation in the Region was inadequate, both numerically and in terms of technical skill and that this inadequacy was attributable to various factors. In some countries it was due to a shortage of trained personnel, in others to a shortage of finance, and elsewhere to a shortage of both. The shortage of inspectors was aggravated in some instances by the fact that they were used for clerical or immunization work. Specialized trained personnel should always be employed on their proper work.

It was also the opinion of the seminar that these officers were generally underpaid and that this largely accounted for the difficulty of recruiting suitable candidates in the required numbers.

In order to improve food sanitation programmes in the Region efforts should be directed towards the following:

(a) the employment of adequate numbers of public health or food inspectors, specially trained for the promotion of food sanitation programmes in the countries of the Region, according to the extent and nature of problems involved;

(b) the adoption of adequate and equitable scales of salary and conditions of service for public health inspectors, commensurate with their duties, not only to attract them into the public health service but to retain them; what was adequate was dependent, of course, on the cost of living in each country.

10.2 Training

The amount of training which public health inspectors received varies from country to country. In some countries there was only in-service training, while in others formal academic training was provided. In certain countries attempts were being made to provide academic training in addition to in-service training.

The standards of education and specialized training of Malaya, North Borneo and Hong Kong were similar. Educational standards in the Philippines were the same as in these three countries, but specialized training was of shorter duration or not done. Both educational standards and specialized training were of lesser standard in South Viet Nam.

While the standard of training was improving in the Region, the facilities and staff required for training still needed improvement. The seminar was of the opinion that the training of public health inspectors should be based on a sound knowledge of the basic sciences, such as physics, chemistry, bacteriology, parasitology, and epidemiology, as recommended by the WHO Expert Committee on Environmental Sanitation in

its fourth report[1]. Inspectors should be given a broad training in all aspects of environmental sanitation, but additional training should be given to those who become specialists in food sanitation.

Participants attached particular importance to adequacy of training and believed that although there should be a sufficient number of inspectors, quality was more important than numbers. The employment of numbers of inadequately trained or inefficient public health inspectors was judged actually to be detrimental.

Participants took note of the fact that the Regional Office had held a seminar on "Education and Training of Sanitation Personnel in the Western Pacific" in Tokyo on 21 October to 5 November 1959. Among the conclusions which this seminar reached were the following:

> "The number of health (sanitary) inspectors is not adequate in any country in the Western Pacific Region and there is urgent need to improve their status and training in many countries. Nine years of schooling together with one year of adequate full-time training should be regarded as minimum qualifications though higher basic education is desirable. Member countries whose needs for more health (sanitary) inspectors are most pressing should provide financial assistance to enable this training to be undertaken.
>
> "All countries throughout the Western Pacific Region should adopt at least the minimum qualifications as set out in the seminar report for the various categories of environmental sanitation personnel so that standardization throughout the Region may be facilitated. WHO should explore the possibility of establishing, at the appropriate time, a regional accreditation scheme for health inspectors which would be acceptable to all Member countries."

Participants were not satisfied that nine years of schooling as suggested in the report of the above-mentioned seminar were adequate for public health inspectors. In their opinion the minimum should be eleven years.

10.3 Access to literature on food sanitation and food technology

Ready access to international publications on food sanitation and technology was considered to be of paramount importance to those engaged in this work. The answers to many questions posed at the seminar had either been reported already or with time would be. Such publications were apparently not readily available in participating countries. Accordingly, it was suggested that action be taken to alleviate this situation. One of the actions proposed was that WHO should assume the

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[1] Wld. Hlth. Org. Tech. Rep. Ser., 1956, 104.

role of collecting relevant material, translating it into English when necessary and seeing that it was properly disseminated, charging for this, if necessary. It was also proposed that WHO should act as a clearing house, distributing among participants information or papers sent it in sufficient quantity for this purpose.

10.4 Professional associations

The seminar discussed the value of professional associations in improving the effectiveness of food sanitation programmes and agreed that the following associations could play a major role in this connection:

(a) associations of medical officers of health;

(b) municipal health officers' associations;

(c) public health inspectors' associations; and

(d) public health and other allied associations.

It was felt that such associations should have at least one or two seminars on food sanitation per year to which members of the public could be invited.

Action might also be taken to form a region-wide association representative of all the various disciplines concerned with food sanitation with the ultimate objective of improving the effectiveness of food sanitation programmes. An association of this kind, by meeting once or twice a year, could provide for the exchange of information and do a great deal to secure the effective implementation of programmes in all the countries concerned.

11. PROMOTION OF RESEARCH INTO FOOD SANITATION PROBLEMS

Research into various problems associated with food sanitation should be stimulated. This research could be conducted either nationally or internationally by countries in the Region, but however the research was carried out, full reports should be made available to all countries. There were numerous problems which could profitably be the subject of research. The following are examples but there may well be others:

(a) the treatment of night soil and garbage, particularly in rural areas, to determine whether it can safely be used for the fertilization of food crops;

(b) design and construction of latrines, with special reference to the prevention of fly entrance or breeding;

(c) the provision or distribution of water where existing methods are inadequate, including the possible use of improvised and non-traditional materials;

(d) cleaning and sanitization of food equipment by simple and practical methods;

(e) cooling of food where mechanical refrigeration is not available.

12. SUMMARY

12.1 Food-borne diseases (Part 4)

The seminar concluded that there was a high incidence of most kinds of food-borne diseases in the Region. It was estimated that the economic loss due to the various diseases of bacterial origin amounts to a minimum of US$71 million.

It was also believed that at least half of the 180 million people living in participants' countries suffered from parasitic diseases and the minimum annual loss caused by these diseases was estimated at US$470 million.

These were believed to be conservative estimates.

12.2 Climate (Part 3)

The high temperatures experienced in the countries of the Region were important from the point of view of food spoilage and consequent waste.

12.3 The influence of environmental factors on food sanitation (Part 7)

The environmental factors which were considered to be most significant in food sanitation were:

(a) water supply;

(b) waste collection and disposal;

(c) control of insects and rodents.

These environmental factors were very important and it was felt that in many parts of the Region they were having a very adverse effect on food sanitation.

12.4 Social and economic factors (Part 3)

A high proportion of the people in the Region lived in rural areas where food sanitation programmes were more difficult to operate than in urban areas.

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12.5 Food supplies (Part 5)

Methods commonly used in the production of food in the Region posed various potential health hazards.

12.6 Food processing (Part 6)

Food processing, although practiced on a limited scale in many participants' countries, showed a serious lack of application of sanitary principles.

12.7 Field work (Part 8)

It was common to find greater attention being paid to food sanitation, including food inspection, in towns and cities than in rural areas. Food sanitation in homes was a generally neglected field, though it was certainly poor in some areas.

Some countries maintained a close check on food imports but others exercised little or no control. International standards for foods were needed.

The sale of food by hawkers was common in many countries of the Region and constituted a serious public health problem.

The importance of health education in raising standards of food sanitation was recognized. A great deal of this work remains to be done in all countries although there is greater activity in this line in some areas than in others.

There were insufficient properly equipped and staffed chemical and bacteriological laboratories in the Region.

12.8 Legislation (Part 9)

No participating country appeared to have all its food sanitation legislation in a single act and legislation in some countries was not being enforced adequately.

12.9 Public health inspectors (Part 10)

The personnel at present engaged in the promotion of food sanitation in the Region was inadequate both numerically and in terms of technical skill. The difficulty of recruiting suitable candidates in the required numbers was due largely to the low salaries offered.

Minimum qualifications for public health inspectors were eleven years of basic schooling plus one year's intensive training in a specialized school. For specialists in food sanitation additional specialized training was necessary.

12.10 Research (Part 11)

There were various problems associated with food sanitation into which research should be conducted.

13. CONCLUSIONS

13.1 In view of the high incidence of food-borne diseases in the Region, there was an urgent need for Member countries to take effective action to raise standards of food sanitation. These diseases caused considerable suffering and economic loss and their prevention could result in substantial gains, both social and economic. In planning the measures which should be adopted various factors must be taken into consideration. One of the most important of these was environmental sanitation. The improvement of water supplies, the safe disposal of wastes particularly sewage and night soil and the proper control of insect and rodent pests, were of vital importance in raising food sanitation standards and reducing food-borne diseases.

13.2 There was a need for a closer inspection to be made of food supplies, both locally produced and imported. Methods used in the growing of food often involved the danger of transmitting intestinal parasites and the standard of sanitation observed in many food manufacturing and processing establishments was low. Some countries did not make arrangements for the adequate inspection of imported foods and this was a situation that should be rectified.

Closer attention should also be paid to food establishments of all kinds, including shops, restaurants and markets.

More visual aids were required for use in health education work connected with food sanitation and a number of ways in which this could be done are suggested in the report.

Governments of participating countries should compile all basic legislation relating to food sanitation in a single act, but the more detailed and technical legislation should be embodied separately in regulations capable of being changed easily to take account of changing circumstances. Legislation must, however, be realistic and be properly enforced. For these reasons it must be related to existing standards in the country and those reasonably capable of being attained.

13.3 There was a general shortage of public health inspectors in the Region and facilities for training were insufficient. The quality of the inspectorate was more important than numbers and the need to increase recruitment should not prevent the improvement of training. The difficulty of recruiting suitable candidates in sufficient numbers was due largely to inadequate salary scales and this matter should receive the attention of governments. The creation of greater opportunities and the development of interest and incentive in order to attract persons of high calibre and dedication into the food field was indicated.

There were not sufficient well-equipped and properly staffed chemical and bacteriological laboratories in the Region to give the service required to support comprehensive food sanitation programmes. Existing laboratories needed improvement and additional laboratories were required. As a matter of fact there appeared to be a critical shortage of manpower, capable of staffing both research and operative programmes.

Public health inspectors should make greater use of field testing aids to assist them in their duties and to reduce loads on laboratories.

13.4 Countries in the Region should either individually or collectively conduct research into various problems associated with food sanitation and a number of subjects were suggested, including the collection and treatment of night soil and garbage and the provision and distribution of water.

13.5 The seminar concluded that the Regional Office should maintain a close liaison with Member countries on the subject of food sanitation so as to be aware of problems and progress in this field and to provide stimulative information, advice and assistance as required. It was suggested that this liaison could most effectively be maintained by having on the regional staff an officer, who would be assigned primarily, if not exclusively, to this work.

13.6 The formation of a professional association stressing food sanitation among Member countries was strongly urged. Annual or more frequent meetings would provide a strong incentive and bond for concerted effort in promoting and continuing programmes as well as the opportunity for the interchange of information in all areas as it became available.

13.7 There was a distinct need for the dissemination of scientific and other information pertaining to food through the medium of technical journals and texts, at the international level. This was a function that might well be assumed by WHO.

ANNEX 1

LIST OF PARTICIPANTS, OBSERVERS AND SECRETARIAT

PARTICIPANTS

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Chief Health Inspector
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JAPAN : Dr. Masaharu Tonomura
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Dr. Mitsuo Kambayashi
Senior Technical Officer and Assistant Chief
Veterinary Sanitation Section
Environmental Sanitation Bureau
Ministry of Health

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Health Section Chief
Seoul City

Mr. Jung Hyun Suh
Sanitation Section Chief
Health and Social Affairs Ministry

MALAYA : Dr. L. S. Sodhy
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Health Department
Federal Capital of Kuala Lumpur

Mr. Mohamed Hashim bin Abdul Malek
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Public Health Inspectors Training School
Kuala Lumpur, Federation of Malaya

Mr. Y. R. Menon
Acting Chief Public Health Inspector
Health Office, Inland Districts
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NORTH BORNEO	:	Mr. Ban Tsan Chuan Chief Health Inspector Medical Department
PHILIPPINES	:	Mr. Vicente F. Buencamino Sanitary Engineering Adviser Division of Environmental Sanitation Bureau of Health Services Department of Health Manila
		Dr. Jose Y. de Guia Assistant Chief Food Inspector Regional Health Office No. 3 Department of Health
SARAWAK	:	Mr. Shim Nyak Siong Health Superintendent Medical and Health Department
SINGAPORE	:	Mr. Patrick Eric Taye Chief Food and Drugs Inspector Ministry of Health
VIET NAM	:	Mr. Nguyen Sy Tin Chef du Bureau de Controle des Insectes et des Rongeurs

OBSERVERS

PHILIPPINES	:	Dr. Carmen D. Austria Medical Specialist I, Food Sanitation Bureau of Health Services Department of Health
		Mr. Luciano Domingo Chief Sanitary Inspector Pasay City
		Mr. P. Garcia Rural Health Inspector II Environmental Sanitation Training Centre Manila

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VIET NAM (US/AID) : Mr. Joseph Haratani
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SECRETARIAT

Mr. James Arbuthnot
Regional Adviser in Environmental Sanitation
Western Pacific Regional Office, WHO
Seminar Secretary

Professor Nicholas A. Milone
Associate Professor
Department of Environmental Health
School of Public Health
University of Michigan
Seminar Consultant

Mr. R. Johnson
Secretary
Association of Public Health Inspectors
London
Seminar Consultant

Mr. John Blaeske
Sanitarian
WHO Project Philippines 51

Mr. S. Chatiketu
Sanitarian
WHO Project Laos 10
Vientiane

ANNEX 2

FOOD SANITATION -- SOME PROBLEM AREAS AND GOALS*

Gentlemen, I deem it an honour and a privilege to serve as one of the two consultants for this seminar. I have been fortunate in being able to make pre-seminar visits to several Member countries thereby becoming acquainted with some of the problems encountered daily by the public health representatives there. I wish to extend my gratitude to them for their patience, kind consideration and fine co-operation during the tour.

Dr. Carey P. McCord, eminent industrial health authority, defines health in human beings as that state in which biologic tissues receive no stimuli from the environment that threaten function or survival. It is a state of full adjustment between biologic tissues and the environment. He considers the environment as more than water, air, food, sewage, work hours and misplaced atomic energy. There is no such thing as a total environment even though convenience and action are served by the recognition of many subdivisions and categories within the total environment. The environment cannot be considered a fixed, a static state. It is as fluid as gas[1]. These remarks serve to introduce the subject and point out the complex we choose to call environmental health.

During 1962, a report was made to the Surgeon General, United States Department of Health, Education and Welfare, Public Health Service by the Committee on Environmental Health Problems[2] appointed for this purpose. The report contains a food section which includes an outline of the Committee's conclusions and recommendations. I am taking the liberty of discussing a few selected excerpts from this report primarily because they reflect views I have held for some time. I consider these as having a direct bearing on at least some of the aspects of the task we have undertaken.

Food protection is defined as the prevention and control of contamination with biological, chemical and physical agents which alone, or in combination with other environmental stresses, adversely affect man's health and the maintenance or improvement of those dietary, sensory or other qualities which contribute to human welfare. Your attention is invited to the broad implications in this definition which transcend the more restrictive earlier concept of food sanitation as protection from food-borne disease only.

Although useful information is available concerning the effects of diet and food contaminants on health the more subtle relationships are not understood. Enough is known, however, to suggest that food alone, or in combination with other factors, may affect man's response to nearly all environmental factors. This observation serves to stress the complexity of the overall problem.

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*Address by Nicholas A. Milone, Associate Professor of Environmental Health, School of Public Health, University of Michigan, Ann Arbor, Michigan.

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As for the food-borne disease aspects of food sanitation we have had notable successes during the past fifty years in controlling botulism, typhoid fever and other severe food-borne diseases, giving rise to the false impression that technical knowledge in this area is adequate to prevent all infections and intoxications of microbial origin. Current sanitation practices in the United States have failed to reduce the high incidence of food-borne diseases during the past eight years. It has been believed that the majority of outbreaks either go unrecognized or are of undetermined etiology. A growing body of evidence indicates that hitherto unsuspected fungi, bacteria, viruses, rickettsia and protozoa may be partially responsible. Because of this, bacteriological, virological, mycological and parasitological investigations to determine kinds, prevalence, persistence and public health significance of potential pathogens[3] in specific foods are indicated.

To complicate the situation there is an enormous and rapidly increasing disparity between the rate at which new public health problems are arising due to growth and technological changes in the food field and the level of effort being directed toward their solution. This situation emphasizes the need for national and international programmes designed to develop additional information, methods and criteria which can be applied to new products and that can be used to protect the health and welfare of the consumer. Efforts are being made in this direction[3].

Another unfavourable and somewhat static condition has been the critical shortage of manpower for both research and operational programmes. This problem warrants a major expansion of training activities but only after the creation of greater opportunities and development of interest and incentive in order to attract persons of high calibre and dedication into the food field.

Collaboration in and contributions to all food control activities by industry, by all levels of government, by technological and scientific associations, and by universities and consumer groups are considered mandatory for maximum effectiveness but only under capable guidance from an agency which is trusted, respected and acceptable to all.

Food research and control programmes should be undertaken by a multidiscipline team, a corps with many varied professional and scientific resources. Specialists in bacteriology, virology, mycology and parasitology are required to investigate the causative phases and develop control measures. Orientation of microbial physiology, genetics and serology as well as medical, veterinary, sanitary, dairy and marine microbiology are necessary to develop sanitation standards and devise preventive measures applicable to the preparation and serving of foods.

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Finally, one important peculiarity of food control should be borne in mind; namely, recognition that the problems involved, to some extent, differ from those encountered in the areas of air and water. Food, in general, is the private property of individuals and business enterprises whose economic interests do not necessarily coincide with the needs of public health. The competitive nature of private enterprise is a barrier to acceptance by industry of full responsibility for food protection. Public pressure has even led to a profusion of laws related to food which sometimes result in the misuse of public health regulations to erect economic barriers.

I have only scratched the surface of the problem areas and goals of food sanitation in this short discussion. It remains for you to explore those that are pertinent and others peculiar to your needs, and where possible, to offer practical solutions. As we all know knowledge refers to facts, wisdom to values, without wisdom knowledge is wasted. One is barren without the other. We are looking to you to provide the wisdom without which this seminar would be fruitless.

REFERENCES

1. McCord, Carey P., Proceedings of the Second National Congress in Environmental Health, Man and His Environment, June 1961. The University of Michigan, School of Public Health, Ann Arbor, Michigan.

2. Report of the Committee on Environmental Health Problems to the Surgeon General, United States Department of Health, Education and Welfare, Public Health Service, 1962. Public Health Service Publication No. 908.

3. Press Release. WHO/40, 5 October 1962. Joint FAO/WHO Inter-governmental Conference on Food Standards. Codex Alimentarius.

ANNEX 3

THE IMPROVEMENT OF FOOD SANITATION[1]

I have been in and associated with the public health service in England for some thirty years and during this time I have acquired experience in all branches of environmental health work, including food hygiene, food inspection and food sampling. During the past twelve years, as Secretary of the Association of Public Health Inspectors, I have had the opportunity of learning about the practice of food hygiene in other parts of the United Kingdom. Then in 1955 I had the privilege of serving as a member of the WHO Expert Committee on Environmental Sanitation and also as rapporteur. The Committee met in Geneva to discuss the subject of food hygiene and copies of the Committee's report have been supplied to you. As a member of the Committee I was able to learn, for the first time, about the problems which faced other countries and the ways in which they were trying to overcome them.

In their report the Committee recommended that WHO should encourage the holding of regional seminars on food hygiene and I am particularly pleased and honoured, therefore, that I should have been invited to act as consultant to this seminar, the first of its kind to be held in the world.

Anyone who compares the problems which face the countries of the Western Pacific Region in attempting to raise their standards of food hygiene with the problems of the United Kingdom, for instance, cannot fail to be impressed by a number of points. The first point is that despite a wide difference in the magnitude of these problems, the principles of food hygiene are the same in both areas--indeed they are the same throughout the world. The only difference is the way in which those principles must be adapted to meet local conditions.

Another important point which should be obvious is that the standard of food hygiene attainable is largely dependent on the standard of general environmental sanitation. The handling of food is so closely allied to general living conditions that there can be no real hope of improving food hygiene unless corresponding advances are made in other aspects of environmental sanitation.

A third point is that a programme to raise the standard of food hygiene stands no chance of success unless it is supported by public opinion. In fact the first task must be to create a public demand for improvement and this may well be the most difficult part of the whole programme. People who, for generations, have suffered from the ill effects of food-borne disease must come to regard these effects as the inevitable and natural hazards of life, and may not realize that much of the ill-health from which they and their families periodically suffer is due to the infection of their food.

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[1] Address by Reginald Johnson, Secretary, Association of Public Health Inspectors, London.

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ANNEX 3

These people must be roused from their apathy. They must be made to realize that these illnesses are not inevitable but can be prevented. But the remedies which are advocated must be related to local circumstances, in other words, they must be practical. To tell people they must do things which they have not the physical means of doing would be useless and could bring the whole food hygiene programme into disrepute. We must, for example, not only tell people to practice clean habits, but we must also make it possible for them to do so. Age-old customs, superstitions, and possibly religious precepts, must also be taken into account by those charged with the duty of promoting food hygiene.

All this points to the necessity of education. But education, in this context, must be directed not only towards food handlers and to schoolchildren, but to the whole community. The instilling of the principles of healthy living into the minds of children should yield long-term results, but this work may be multiplied by conditions in the home and by the attitude of parents and other members of the family. Our efforts, therefore, must be directed to all sections of the community.

There is no short or easy path to success in this educational work. It demands continuous effort and advantage must be taken of every opportunity which presents itslef. It takes many different forms, varying from formal talks to groups of interested people, to the quiet words of advice or explanation which the public health inspector may give to individual food handlers at their place of work or to people in their own homes.

I have thought that you might be interested to see some of the materials which we use in the United Kingdom in health education. I have, therefore, arranged a display of posters and leaflets which you can examine during the seminar. This material has been designed, of course, to suit conditions in my country and you may feel that it would not be suitable for use in your countries. It may, however, give you some ideas which you could adapt for your own use. During the seminar you will also have an opportunity of seeing films made in the United Kingdom. When you have seen them I think you will agree that they reinforce the point I made earlier that the principles of food hygiene are the same everywhere.

This brings me to my final point--the need for a properly trained and adequate field staff to promote food hygiene and, in fact, for environmental sanitation work in general. The promotion of food hygiene requires the skills of various trained workers, including doctors, laboratory technicians, health educators, engineers and veterinarians, but it is the public health inspector (by whatever name he is known) who plays the vital role in the field. The success of any food hygiene programme will depend very largely on his skill, efficiency and enthusiasm.

The number of inspectors employed must be adequate and they must enjoy a satisfactory status if they are to operate effectively. Finally, they must be armed with adequate legal powers, for although I have stressed the importance of education, reliance cannot be placed entirely on this approach. The prosecution of offenders is an essential part of food hygiene work. Indeed a successful prosecution, with the resulting publicity, can have a very helpful effect on other food handlers in the area. In other words, legal proceedings also have an educational aspect.

In conclusion, I am delighted to be here with you and I am looking forward to learning more about food hygiene problems in a part of the world which is quite new to me. I hope that I may be able to help you to decide the best ways of achieving the principal objective of this seminar, which is to promote the improvement of food sanitation in Member countries of the Western Pacific Region.

ANNEX 4

SEMINAR SCHEDULE

16 October - Tuesday

0900 - 1000	Opening address by Dr. I. C. Fang, Regional Director Orientation by Mr. J. Arbuthnot, Regional Adviser in Environmental Sanitation Addresses by Professor N. A. Milone and Mr. R. Johnson, seminar consultants
1000 - 1030	Appointment of Chairman Adoption of seminar schedule and topics for discussion
1045 - 1200	Appointment of discussion groups Appointment of Co-ordinating Committee Appointment of Editorial Committee
1400 - 1700	Discussion Groups A, B, and C: Discussion on introductory topic and preparation of report

17 October - Wednesday

0900 - 1200	Plenary session: Consideration of reports on introductory topic
1400 - 1530	Lecture: "Cysts and Ova of Intestinal Parasites Found in Vegetables Usually Eaten Raw" by Angel D. Paguio, M.D., Department of Preventive Medicine, Microbiology and Parasitology, Faculty of Medicine, University of Santo Tomas, Manila
1545 - 1700	Lecture: "The Problem of Food Sanitation in the Home" by John Blaeske, WHO Sanitarian, Project Philippines 51

18 October - Thursday

0900 - 1200	Discussion groups D, E, and F: Discussion on topics 1 to 3
1400 - 1700	Discussion groups D, E, and F: Continuation of discussion on topics 1 to 3
1700 - 1800	Film show

19 October - Friday

0900 - 1200	Discussion groups D, E, and F: Preparation of reports on topics 1 to 3
1400 - 1700	Discussion groups G, H, and I: Discussion on topics 4 to 6

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20 October - Saturday

0900 - 1200 Discussion groups G, H, and I: Continuation of discussion on topics 4 to 6

22 October - Monday

0900 - 1200 Discussion groups G, H, and I: Preparation of reports on topics 4 to 6

1400 - 1700 Plenary session: Consideration of reports on topics 1 to 3

23 October - Tuesday

0900 - 1200 Plenary session: Consideration of reports on topics 4 to 6

1400 - 1700 Discussion groups J, K, and L: Discussion on topics 7 to 9

24 October - Wednesday

0900 - 1200 Discussion groups J, K, and L: Continuation of discussion on topics 7 to 9

1400 - 1700 Discussion groups J, K, and L: Preparation of reports on topics 7 to 9

25 October - Thursday

0830 - 1200 Field visits to a market, cannery and sterilized milk plant

1400 - 1700 Plenary session: Consideration of reports on topics 7 to 9

26 October - Friday

0900 - 1200 Field visit to rural health development area

1400 - 1700 General review of reports on topics 1 to 9 and discussion of draft final report

27 October - Saturday

0900 - 1200 Conclusions
Evaluation of seminar
Closing

ANNEX 5

MEMBERSHIP OF DISCUSSION GROUPS

Discussion Group D -- Topic 1 - Food-borne illnesses

Dr. Carmen D. Austria
Mr. John Blaeske
Dr. Mitsuo Kambayashi
Mr. Y. R. Menon
Dr. L. S. Sodhy
Mr. Patrick Eric Taye
Dr. Masaharu Tonomura

Discussion Group E -- Topic 2 - Food supplies and food habits

Mr. Ban Tsan Chuan
Mr. Vicente Buencamino
Mr. Joseph Haratani
Mr. Mohamed Hashim bin Abdul Malek
Mr. Shim Nyak Siong
Mr. Nguyen Sy Tin
Mr. Robert Tyson

Discussion Group F -- Topic 3 - Methods of food processing, storage, distribution and sale

Mr. S. Chatiketu
Mr. Luciano Domingo
Mr. P. Garcia
Dr. Jose Y. de Guia
Dr. Chang Soon Kim
Mr. Jung Hyun Suh
Mr. Patrick Wong Peng Ho

Discussion Group G -- Topic 4 - Present influences of environmental factors on food sanitation

Mr. Vicente F. Buencamino
Mr. P. Garcia
Mr. Joseph Haratani
Mr. Mohamed Hashim bin Abdul Malek
Dr. Chang Soon Kim
Mr. Shim Nyak Siong
Mr. Jung Hyun Suh

ANNEX 5

Discussion Group H -- Topic 5 - Personnel; notification and investigation of outbreaks of food-borne illnesses; and bacteriological and chemical laboratories

Dr. Carmen D. Austria
Mr. Ban Tsan Chuan
Mr. John Blaeske
Dr. Mitsuo Kambayashi
Dr. L. S. Sodhy
Mr. Patrick Eric Taye
Dr. Masaharu Tonomura

Discussion Group I -- Topic 6 - Legislation and field work

Mr. S. Chatiketu
Mr. Luciano Domingo
Dr. Jose Y. de Guia
Mr. Y. R. Menon
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FOOD-BORNE DISEASES

The list given below contains some diseases in the transmission of which food plays an essential role, such as in the case of certain parasites where a food animal is the host or intermediate host. It also contains other diseases which can be transmitted by the contamination of food as well as in other ways.

1. Bacterial diseases

Disease	Causative organism	Vector or means of spread
Anthrax	Bacillus anthracis	Contaminated meat
Botulism	Clostridium botulinum	Anaerobic growth of spores in inadequately processed canned or bottled food
Cholera	Vibrio cholerae	Contaminated water or food; flies
Dysentery bacillary	Various species of genus shigella	Contaminated water or food; flies
Paratyphoid fever	Salmonella spp	Contaminated food, particularly with milk, milk products, shellfish; flies
Salmonellosis	Salmonella spp	Contaminated food, particularly meat and meat products and milk products
Staphylococcal infections	Staphylococcus spp	Food contaminated from human sources
Streptococcal infections	Streptococcus spp	Food contaminated from human sources
Tuberculosis	Mycobacterium tuberculosis	Contaminated milk, milk products and meat
Typhoid fever	Salmonella typhi	Contaminated water and food, particularly milk, milk products and shellfish

2. Parasitic diseases

Disease	Causative organism	Vector or means of spread
Amoebiasis	Entamoeba hystolitica	Contaminated food, particularly vegetables eaten raw; water
Ascariasis	Ascaris lumbricoides	Contaminated vegetables eaten raw
Clonorchiasis	Clonorchis sinensis	Raw or partially cooked infected fresh water fish
Diphyllobothriasis	Diphyllobothrium latum	Raw or partially cooked infected fresh water fish
Enterobiasis	Enterobius vermicularis	Contaminated food
Fasciolopsiasis	Fasciolopsis buski	Contaminated vegetables eaten raw
Hydatidosis	Enchinococcus granulosus	Contaminated food and water
Taeniasis and cysticercosis	Taenia saginate Taenia solium and its larval form Cysticercus cellulosae	Infected beef Infected pork
Trichinosis	Trichinella spiralis	Infected pork
Trichuriasis	Trichiura	Contaminated food

ANNEX 7

LIST OF WORKING PAPERS

WPR/Env.San./Food San./1	FOOD HYGIENE IN THE UNITED KINGDOM by Morley Parry, F.R.S.H., F.A.P.H.I.
WPR/Env.San./Food San./2	CYSTS AND OVA OF INTESTINAL PARASITES FOUND IN VEGETABLES USUALLY EATEN RAW by Angel D. Paguio, M.D.
WPR/Env.San./Food San./3	THE PROBLEM OF FOOD SANITATION IN THE HOME by John Blaeske
WPR/Env.San./Food San./4	FOOD SANITATION IN VIET NAM by Nguyen Sy Tin
WPR/Env.San./Food San./5	STATUS OF FOOD SANITATION IN THE PHILIPPINES by Vicente F. Buencamino, S.E., M.P.H.
WPR/Env.San./Food San./6	FOOD SANITATION IN SINGAPORE by Patrick Eric Taye
WPR/Env.San./Food San./7	FOOD SANITATION IN MALAYA by Y. R. Menon and Md. Hashim
WPR/Env.San./Food San./8	FOOD SANITATION IN SARAWAK by Shim Nyak Siong
WPR/Env.San./Food San./9	FOOD SANITATION by Jose Y. de Guia, M.D.
WPR/Env.San./Food San./10	FOOD SANITATION IN NORTH BORNEO by Ban Tsan Chuan
WPR/Env.San./Food San./11	PRESENT STATUS OF FOOD SANITATION IN KOREA by Suh Jung Hyun and Kim Chang Soon, M.D.
WPR/Env.San./Food San./12	FOOD SANITATION IN JAPAN by M. Tonomura, M.D. and M. Kambayashi, M.D.
WPR/Env.San./Food San./13	THE PRESENT STATUS OF FOOD SANITATION IN THE REPUBLIC OF CHINA by Cheng Chang Tse and Chen Yuh-pan